We Claim:

1. An optical waveguide having a refractive index profile pre-selected to generate positive dispersion when operated substantially in a single high order mode, such that the total dispersion of said waveguide, equal to the sum of the material dispersion and the waveguide dispersion is greater than 50 ps/nm/km at a given wavelength within the operative range.
2. The optical waveguide of claim 1 wherein said total dispersion is greater than 100 ps/nm/km at said given wavelength within the operative range.
3. The optical waveguide of claim 1 wherein said optical waveguide is a few mode fiber.
4. The optical waveguide of claim 1 wherein said optical waveguide has a positive dispersion slope at said given wavelength.
5. The optical waveguide of claim 1 wherein said optical waveguide has a negative dispersion slope at said given wavelength.
6. The optical waveguide of claim 1 wherein said optical waveguide has a nominally zero dispersion slope at said given wavelength.
7. The optical waveguide of claim 1 wherein said single high order mode is the LP_{02} mode.
8. The optical waveguide of claim 1 wherein said single high order mode is the LP_{03} mode.
9. A method of generating positive dispersion comprising the steps of;

providing an optical waveguide having a refractive index profile pre-selected to generate positive waveguide dispersion when operating in substantially a single high order mode, and

operating said optical waveguide in said single high order mode in an operative range, whereby the total dispersion of said waveguide, equal to the sum of the material dispersion and said waveguide dispersion is greater than 50 ps/nm/km at a given wavelength within said operative range.

10. The method of claim 9 wherein said optical waveguide is a few mode fiber.

11. The method of claim 9 wherein the sum of the material dispersion and said waveguide dispersion is greater than 100 ps/nm/km at a given wavelength within said operative range.

12. The method of claim 9 wherein said optical waveguide has a positive slope at said given wavelength.

13. The method of claim 9 wherein said optical waveguide has a negative slope at said given wavelength.

14. The method of claim 9 wherein said optical waveguide has a nominally zero dispersion at said given wavelength.

15. The method of claim 9 wherein said single high order mode is the LP_{02} mode.

16. The method of claim 9 wherein said single high order mode is the LP_{03} mode.

17. An apparatus for introducing positive dispersion to an optical signal comprising;

at least one mode transformer;

an optical waveguide having a refractive index profile pre-selected to generate positive dispersion to the optical signal when operated substantially in a single high order mode, said optical waveguide being in optical communication with the output of said mode transformer;

whereby said optical signal is output from said mode transformer in said high order mode, and the output of said mode transformer is an optical signal substantially in said single high order mode.

18. The apparatus of claim 17 wherein said mode transformer is a transverse mode transformer.

19. The apparatus of claim 17 wherein said high order mode is the LP_{02} mode.

20. The apparatus of claim 17 wherein said high order mode is the LP_{03} mode.